

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

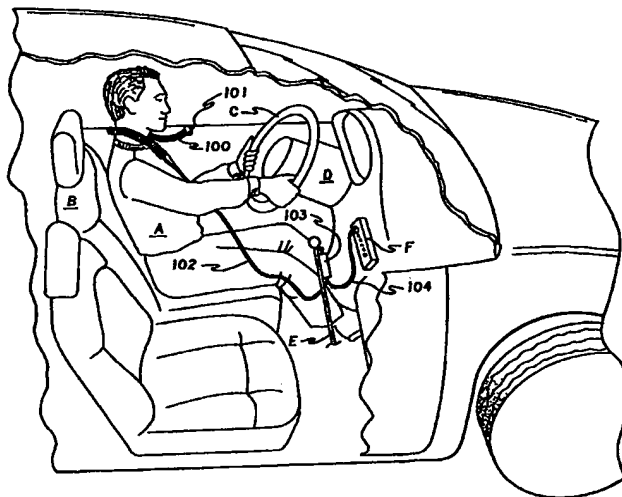
(51) International Patent Classification ⁶ : H04R 25/00, H04B 1/34	A1	(11) International Publication Number: WO 98/19497 (43) International Publication Date: 7 May 1998 (07.05.98)
---	-----------	--

(21) International Application Number: PCT/US97/01150
(22) International Filing Date: 8 January 1997 (08.01.97)
(30) Priority Data:
60/029,192 30 October 1996 (30.10.96) US

(71)(72) Applicant and Inventor: STANDLEY, Timothy, L.
[US/US]; 468 Union Street Apartments, Bangor, ME 04401
(US).

(74) Agent: LITMAN, Richard, C.; Litman Law Offices, Ltd.,
Crystal City Station, P.O. Box 15035, Arlington, VA
22215-0035 (US).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR,
BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE,
HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS,
LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL,
PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA,
UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB,
GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ,
CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).

Published*With international search report.***(54) Title: NECK SUPPORTED MICROPHONE****(57) Abstract**

A neck supported microphone (101) mounted on the end of a flexible rod (100). The flexible rod can be bent into any desirable shape and it will hold the desired shape. The rod is long enough to drape around the neck and hold the microphone in front of the speaker's face. As people speak at different levels, the rod can be adjusted to hold the microphone closer to or farther from the user's mouth. In addition, should the user wish to mount the microphone elsewhere (on the back of a seat, on a sun visor, on the steering column, etc.), the rod can simply be bent to conform to the desired location. The key button (200) is located in a housing (103) on the wire running from the microphone and flexible rod to the CB (F). For ease of use, this housing may be mounted in various locations in the cab of the vehicle by using Velcro, for instance. The ideal location is on the gear shift lever (E), as tractor trailer truck drivers tend to rest their right hand on the lever due to the large amount of gear shifting required with these vehicles.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CI	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

NECK SUPPORTED MICROPHONE

CROSS-REFERENCE TO RELATED APPLICATION

This application is based on provisional patent application serial number (unassigned--Attorney Docket No. 12767.00), filed October 30, 1996.

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

The present invention relates to a device that supports a microphone element using a flexible rod that is placed around the user's neck.

2. DESCRIPTION OF THE PRIOR ART

The primary use of the present invention is to provide a comfortable and convenient method for the driver of a truck or other vehicle to use a microphone. This is useful when the driver wishes to operate a citizens band radio, or other communication devices having external microphone capability. Many devices are known for supporting these microphones, and for supporting associated push-to-talk switches in convenient locations. In some instances the microphone is hung from an overhead location by a cord, which results in obscuring the driver's line of sight and creates an unsafe driving condition. Some of these devices support the microphone by a cord or strap around the user's neck. None of the prior art devices, however, support the microphone close to the user's mouth, while also allowing a large range of flexibility in changing the size and shape of the supporting device.

U.S. Patent No. 3,118,980 (Hamson) issued January 21, 1964, discloses a microphone which is supported by the microphone's electrical cord being looped around the user's neck and being reattached to the microphone. U.S. Patent No. 3,928,734 (Noury, Jr.) issued December 23, 1975, discloses a collar that supports a microphone on a post. While this device

maintains the microphone directly in front of a user's mouth, the collar must be worn relatively tightly, and as such is rather uncomfortable. U.S. Patent No. 4,060,697 (Neal) issued November 29, 1997, discloses a microphone holder that is a telescoping rod pivotally mounted on a vehicle dashboard and which includes a remote push-to-talk button located on a lever on the steering column. U.S. Patent No. 4,151,468 (Kerr) issued April 24, 1979, discloses a flexible microphone support attached to the back of a seat and including a foot operated push-to-talk mechanism. U.S. Patent No. 4,325,143 (Kerr) issued April 13, 1982, discloses a microphone mounted on a long flexible extension which is attached to a rod which in turn mounts on a citizens band radio, and also includes a foot operated push-to-talk mechanism. U.S. Patent No. 5,163,093 (Frielingsdorf et al.) issued November 10, 1992, discloses a microphone supported by a strap around a user's neck which maintains the microphone in contact with the neck so that it may pick up sounds through bone conduction. German Patent No. 205,321 issued December 19, 1908, discloses a microphone supported by a strap around a user's neck.

Flexible support rods have been used for various devices. Some examples of these include U.S. Patent Nos. 5,154,483 (Zeller) issued October 13, 1992, and 5,276,596 (Krenzel) issued January 4, 1994, and these patents are hereby incorporated by reference.

None of the above inventions and patents, taken either singularly or in combination, is seen to describe the instant invention as claimed. Thus, a neck supported microphone solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

The present invention obviates the above problems by mounting a microphone element on the end of a flexible

rod. The flexible rod can be bent into any desirable shape and when released the rod holds this shape. The rod is long enough to drape around the user's neck and hold the microphone element in front of their face.

5 A push-to-talk button is located in a housing on a wire running from the microphone element to a citizens band radio (CB), cellular telephone, or other device using a microphone. The push-to-talk button housing is elongate and is intended to be mounted in various
10 convenient locations in the cab of the vehicle. The preferred method of mounting includes the use of hook and loop type fasteners that allow the housing to be removed and relocated in various positions. The ideal location is on the gear shift lever, as tractor
15 trailer truck drivers tend to rest their right hand on the lever due to the large amount of gear shifting required with these vehicles. The wire that extends between the microphone and the push-to-talk button housing is approximately 5 feet long while the wire
20 that extends between the push-to-talk button housing and the external microphone plug is about 5-12 feet long. This allows the push-to-talk button housing to be located in different areas (such as turn signal indicator shafts, steering wheel columns, door panels,
25 etc.).

A major feature of the present invention is the use of the flexible rod to support the microphone element. As opposed to prior art neck supported microphones, the flexible rod design is capable of both maintaining
30 the microphone element directly in front of the user's mouth, as well as reducing any pressure applied to the user's neck. This is due to the ability of the flexible rod to be bent into any desired shape and, when released, to hold this shape. A user first bends
35 the rod into a loop that fits loosely about their neck. The rod is then bent upwards near the microphone end of the rod, thereby holding the

microphone directly in front of the user's mouth. As people speak at different levels, the rod can be adjusted to hold the microphone element closer to or farther from the user's mouth. In addition, should the user wish to mount the microphone elsewhere (on the back of a seat, on a sun visor, on the steering column, etc.), the rod can simply be bent to conform to the desired location.

Accordingly, it is a principal object of the invention to mount a microphone element directly in front of a driver's mouth in a safe manner by not obscuring the driver's line of sight.

It is another object of the invention to provide a quick, easy and comfortable way to mount a microphone element directly in front of a user's mouth in a hands free manner.

It is still another object of the invention to mount a push-to-talk button in a convenient location.

It is an object of the invention to provide improved elements and arrangements thereof in a neck supported microphone for the purposes described which is inexpensive, dependable and fully effective in accomplishing its intended purposes.

These and other objects of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an environmental view of a vehicle driver using the neck supported microphone according to the present invention.

Fig. 2 is a diagrammatical view of the neck supported microphone connected to a conventional citizen's band radio.

Fig. 3 is a top view of a second preferred embodiment of the flexible rod, including a partially exploded view of an interior section of the rod.

Similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

5 The present invention is shown in use in figure 1. A driver A is shown seated in the cab of a vehicle which includes: a seat B; a steering wheel C; a steering column D; a gear shift lever E; and a citizens band radio F or other audio receiving device using a microphone (i.e. cellular phone). The flexible rod 100 is shown, carefully positioned about the nape of the neck of the driver A, and includes microphone element 101. An audio cable 102 leads from the flexible rod 100 to the push-to-talk button housing 103. A second cable 104 extends between the push-to-talk button housing 103 and citizens band radio F. Audio cable 102 is between five to six feet long from where it leaves the flexible rod 100 to where it enters the push-to-talk button housing 103, while the second cable 104 is five to twelve feet long from the push-to-talk button housing 103 to the citizens band radio F, thereby allowing mounting of the push-to-talk button housing 103 in a number of convenient locations. In the preferred embodiment, the audio cable 102 and 104 are coiled cables, (similar to coiled phone cords), and the above lengths of these cables are the cable lengths in the relaxed state. Therefore, the extended length of these cables would be substantially longer than the five to six feet, and five to twelve feet lengths stated above. It should also be apparant that the length of the audio cables 102 and 104 may be varied without departing from the scope of the invention.

35 The details of the present invention are better seen in figure 2. Microphone 101 includes a foam covering that reduces background and wind noise. The internal microphone element is preferably a noise cancelling

condenser microphone as is well known in the art, however, other type microphones can be used. The internal components of the push-to-talk button housing 103 can also be seen in figure 2. The external case 210 of the push-to-talk button housing 103 can be square or circular in cross section depending on the desired location to mount the push-to-talk button housing 103. Push-to-talk button 200 is mounted on a shaft 201 that operates a key switch 202 when the operator presses the push-to-talk button 200 to transmit. Audio line 203 is 22-24 gauge wire and is routed from the microphone element 101 through the flexible rod 100, cable 102, case 210 and cable 104 to the plug 211 connected to the citizens band radio F. A ground line 204 is routed in similar fashion, and is also connected to one side of key switch 202. Line 205 is connected to the other side of key switch 202, and routed through cable 104 to provide ground potential to activate the transmit mode of the citizens band radio F, when the operator presses the push-to-talk button 200.

Two straps 206 and 207 are provided to mount the push-to-talk button housing 103. Strap 206 has a hook type fastener 208 and the other strap 207 has a loop type fastener 209, which are disposed to be placed in enmeshing engagement for connecting the straps together after they are looped around the desired mounting location. It should be noted that one strap can be used in place of straps 206 and 207 with fasteners at opposed ends. While the preferred location for mounting the push-to-talk button housing 103 is on the gear shift lever E, housing 103 can be mounted upon a turn signal indicator, steering wheel column, or it can be hand held by the radio operator. The plug 211 that connects the cable 104, (and associated wires 203-205), to the citizens band radio F, can be a four pin, five pin, or any mating

connector depending upon the device to which the microphone is connected.

5 Details of the preferred embodiment of the flexible rod 100 are shown in figure 3. A bendable metallic wire 301 extends through a rubber sheath 300. The wire 301 is about 1/16th of an inch thick, and is made of a metal that will bend and then retain its shape. A coat hanger wire can be used as a low cost alternative, assuming the wire is not reshaped too often. The rubber sheath 300 protects the microphone cord 102, as well as provides a comfortable fit where the flexible rod 100 contacts the user. The overall diameter of the rubber sheath 300 is preferrably about 1/8th of an inch, however, various other diameters may also be used. Once the flexible rod 100 has been bent to an individual's desired shape, the flexible rod 100 (including microphone element 101) can be lifted off of the individual's neck (assuming it has not been bent to a shape smaller than the individual's head) and placed in a storage location. By removing the flexible rod 100 without reshaping it, the usable life of the rod 100 can be extended, especially when weaker metals (such as coat hanger wire) are used. The flexible rod 100 is preferably about 25 inches long, although longer lengths can be used depending on individual neck sizes, or alternate mounting locations.

20 It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

CLAIMS

1. A neck supported microphone for use with an audio device comprising:

a microphone element;

a push-to-talk button housing;

a microphone plug connectable to said audio device;

a first audio line extending between said microphone element and said push-to-talk button housing;

a second audio line extending between said push-to-talk button housing and said microphone plug; and

an elongated flexible rod that supports said microphone element, said flexible rod having an inner, shape retaining, bendable wire support means and an outer rubber sheath, said first audio line extending through said rubber sheath.

2. The neck supported microphone as defined in claim 1, further comprising:

a foam covering mounted around said microphone element to reduce background and wind noise.

3. The neck supported microphone as defined in claim 1 wherein said microphone element is a noise cancelling condenser microphone.

4. The neck supported microphone as defined in claim 1 wherein:

said push-to-talk button housing comprises:

an external case;

a push-to-talk button mounted on a shaft;

and

a key switch operably connected to said shaft; and wherein

when said push-to-talk button is pressed said key switch is operated to activate said neck supported microphone.

5. The neck supported microphone as defined in claim 4 wherein said external case further comprises:

a first mounting strap having a first fastening means;

a second mounting strap having a second fastening means that is connectable to said fastening means; and wherein

said first and second straps are connectable to each other using said first and second fastening means to mount the external case in a desired location.

6. The neck supported microphone as defined in claim 1 wherein said inner bendable wire is about 1/16th of an inch in diameter.

7. The neck supported microphone as defined in claim 1 wherein said outer rubber sheath is about 1/8th of an inch in diameter.

8. The neck supported microphone as defined in claim 1 wherein said first audio line is five to six feet long from a point where it leaves said flexible rod to a point where it enters said push-to-talk button housing.

9. The neck supported microphone as defined in claim 8 wherein said first audio line is five feet long from said point where it leaves said flexible rod to said point where it enters said push-to-talk button housing.

10. The neck supported microphone as defined in claim 1 wherein said second audio line is five to

twelve feet long from said push-to-talk button housing to said microphone plug.

11. The neck supported microphone as defined in claim 10 wherein said second audio line is twelve feet long from said push-to-talk button housing to said microphone plug.

12. A neck supported microphone for use with an audio device comprising:

a microphone element;

a push-to-talk button housing;

a microphone plug connectable to said audio device;

a first audio line extending between said microphone element and said push-to-talk button housing;

a second audio line extending between said push-to-talk button housing and said microphone plug;

an elongated flexible rod that supports said microphone element, said flexible rod having an inner, shape retaining, bendable wire support means and an outer rubber sheath, said first audio line extending through said rubber sheath;

said inner bendable wire being about 1/16th of an inch in diameter;

said outer rubber sheath being about 1/8th of an inch in diameter; and

said elongated flexible rod being about 25 inches long.

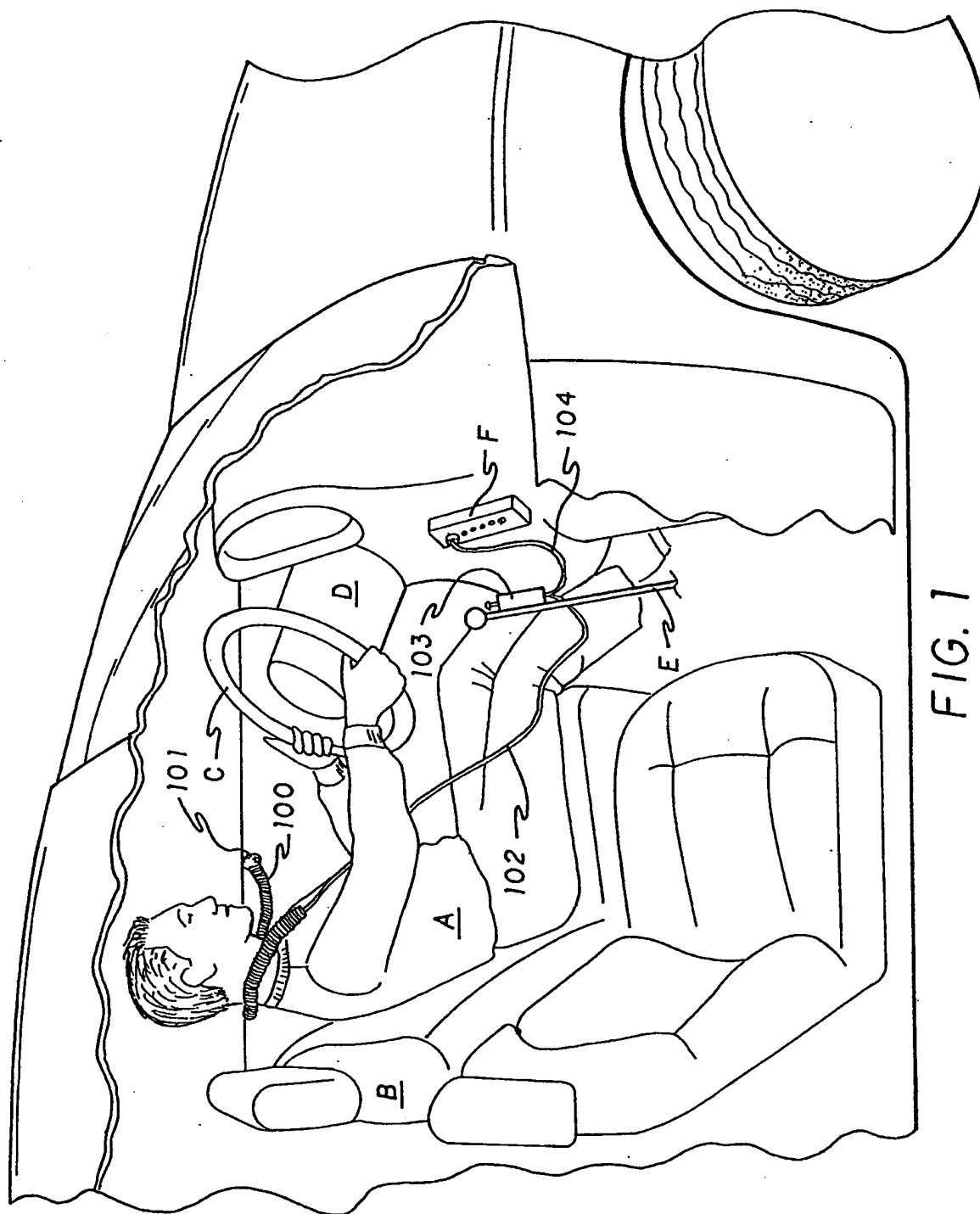


FIG. 1

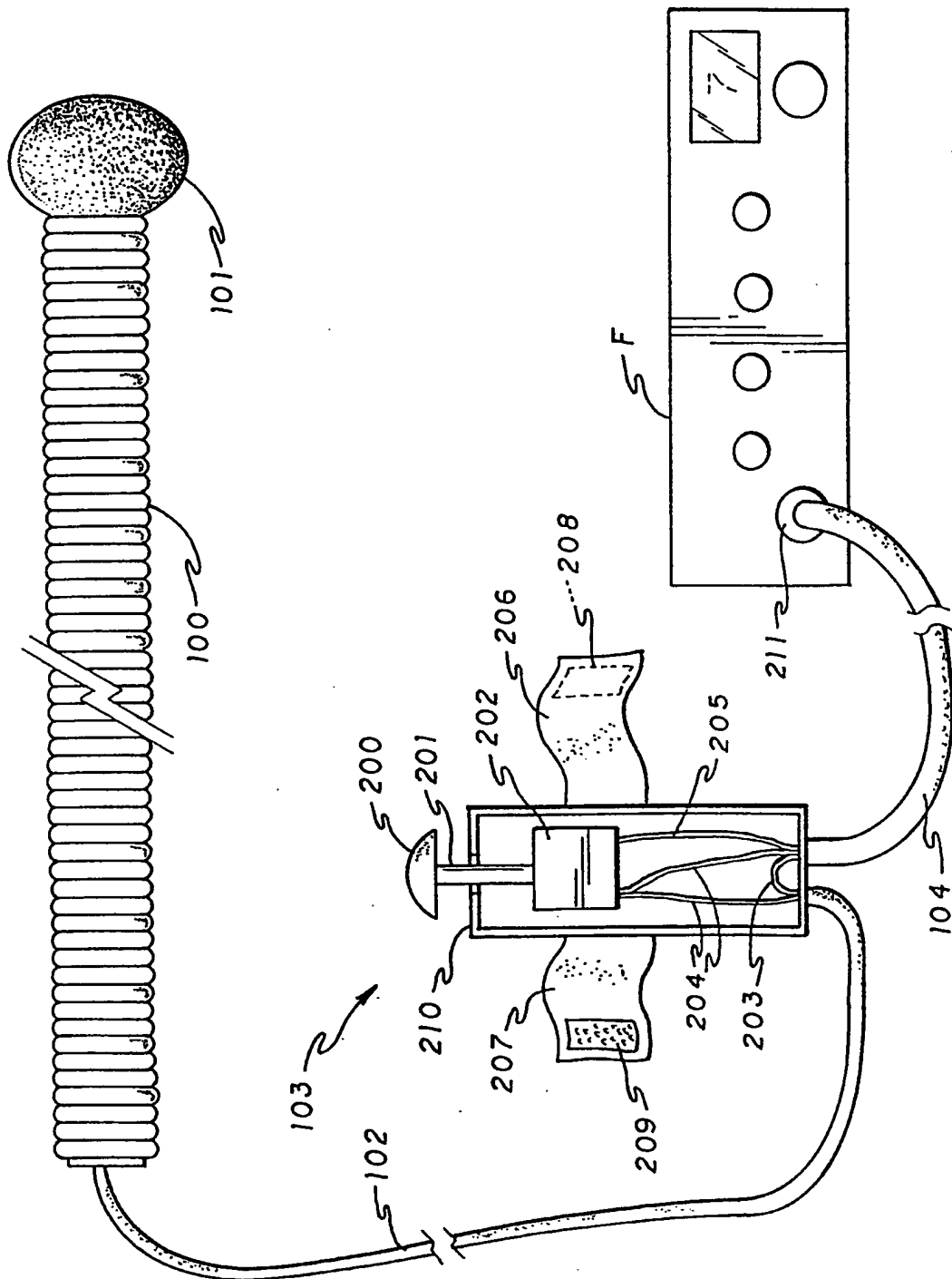


FIG. 2

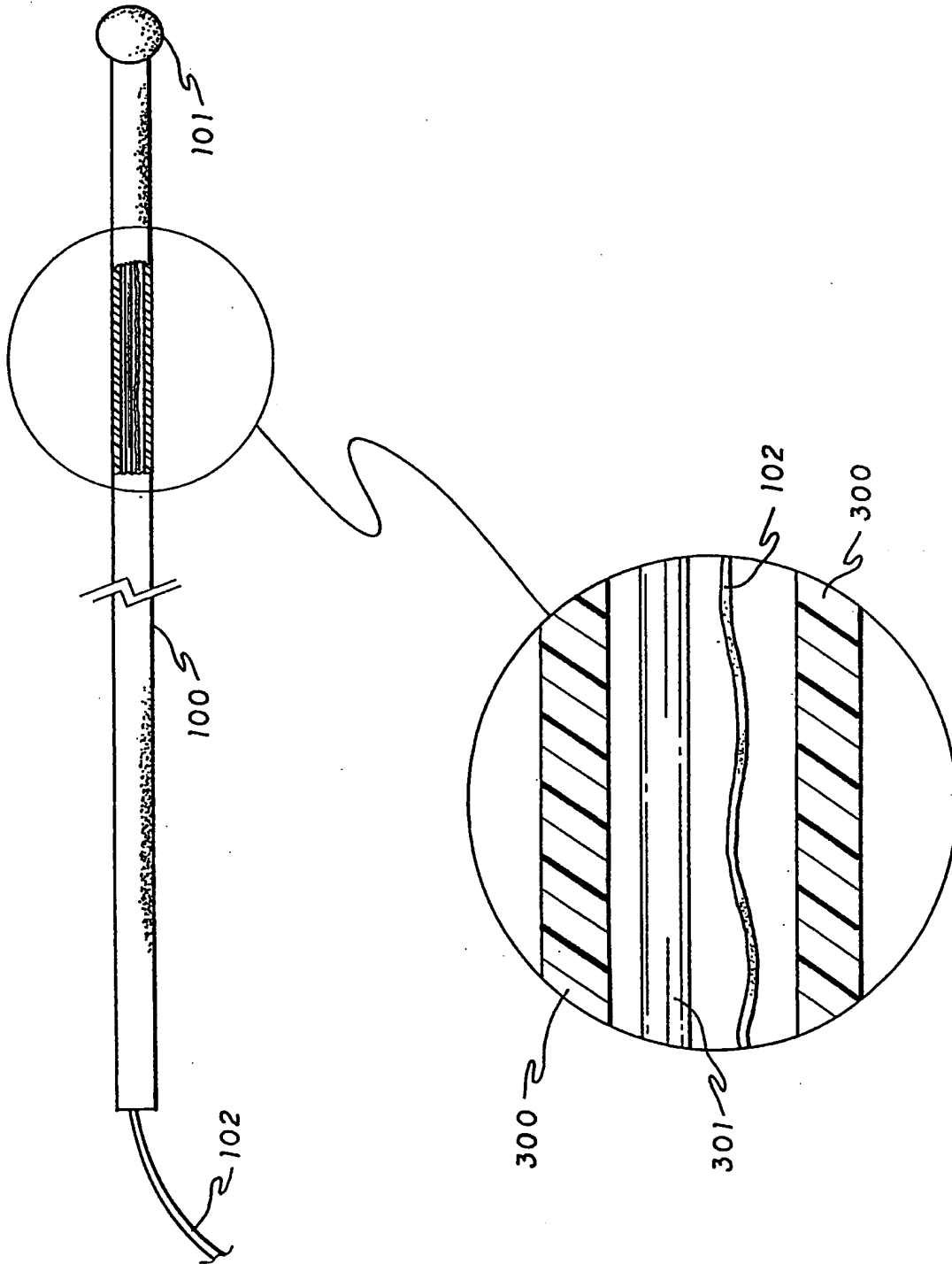


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US97/01150

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :H04R 25/00; H04B 1/34

US CL :381/169, 168, 86; 455/90, 89, 345

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 381/169, 168, 86; 455/90, 89, 345, 91, 99

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
noneElectronic data base consulted during the international search (name of data base and, where practicable, search terms used)
none**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US, 3,868,571 A 3(GREINER) 25 FEBRUARY 1975, entire document.	1-12
A	US, 3,944,924 A (MIYACHI) 16 MAY 1976, figure 1.	1-12
A	US, 4,061,971 A (BARRONS) 06 DECEMBER 1977, figure 1.	1-12
A	US, 4,151,468 A (KERR) 24 APRIL 1979, figure 1.	1-12
A	US, 5,548,810 A (RIDDELL ET AL.) 20 AUGUST 1996, see figure.	1-12

☐ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier document published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 10 APRIL 1997	Date of mailing of the international search report 19 MAY 1997
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231	Authorized officer SINH TRAN
Facsimile No. (703) 305-3230	Telephone No. (703) 305-3700